ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

WAIMAKARIRI DISTRICT COUNCIL AND GENESIS ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 29 November 2021

Date audit report completed: 16 December 2021

Audit report due date: 01-Dec-21

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EXECUTIVE SUMMARY

This audit of the **Waimakiriri District Council (WDC)** Unmetered Streetlights DUML database and processes was conducted at the request of **Genesis Energy Limited** (**Genesis**), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

WDC is located on the MainPower network. MainPower was previously engaged as the streetlighting maintenance contractor and were providing a monthly report from their database. Genesis have been using the last database extract provided by Mainpower until November 2021 when reporting has been provided from the RAMM database. This audit is the first audit of the WDC RAMM database.

WDC are managing the RAMM database and the streetlighting maintenance contractor is Power Jointing. The field work and asset data capture is conducted by Power Jointing using Pocket RAMM.

WDC are establishing new processes and gaining an understanding of managing RAMM.

The field audit was undertaken of a statistical sample of 352 items of load on 8th December 2021.

This audit found five non-compliances and makes three recommendations. The future risk rating of 42 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis's comments and recommend that the next audit be in six months to allow new processes to be put in place.

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	Incorrect submission for two ICPs resulting in an estimated under submission of 78,894 kWh from March-November 2021. Database accuracy is outside of the allowable threshold resulting in an estimated under submission of 138,500 kWh per annum. 198 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 70,190 kWh per annum. 361 items have the incorrect wattage applied indicating an estimated over submission of 5,616 kWh per annum. Eight lamps recorded as 350W MH but no such model exists. These are likely to be overstated and therefore over submission will be occurring. Festive lights not recorded in RAMM resulting in a small amount of under submission. The monthly wattage report provided does not track changes on a daily basis and is provided as a snapshot.	Weak	High	9	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Description and capacity of load	2.4	11(2)(c) & (d) of Schedule 15.3	198 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 70,190 kWh per annum.	Weak	High	9	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	21 additional lights (6%) found in the field from the 352 items of load sampled.	Weak	Medium	6	Investigating
Database Accuracy	3.1	15.2 and 15.37B(b)	Database accuracy is outside of the allowable threshold resulting in an estimated under submission of 138,500 kWh per annum. 198 lights with no lamp description or total wattage recorded. 361 items have the incorrect wattage applied indicating an estimated over submission of 5,616 kWh per annum. Eight lamps are recorded as model 350W MH in the database, this not a valid wattage for the lamp type. 533 items of load with an incorrect ballast of one recorded. Festive lights not recorded in RAMM.	Weak	High	9	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 and 15.37B(c)	Incorrect submission for two ICPs resulting in an estimated under submission of 78,894 kWh from March-November 2021. Database accuracy is outside of the allowable threshold resulting in an estimated under submission of 138,500 kWh per annum. 198 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 70,190 kWh per annum. 361 items have the incorrect wattage applied indicating an estimated over submission of 5,616 kWh per annum. Eight lamps recorded as 350W MH but no such model exists. These are likely to be overstated and therefore over submission will be occurring. Festive lights not recorded in RAMM resulting in a small amount of under submission. The monthly wattage report provided does not track changes on a daily basis and is provided as a snapshot.	Weak	High	9	Investigating
					Future Risk Rating	**42**	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Recommendation
ICP identifier	2.2	Correct the ICP number recorded incorrectly: 0000565850KEA7B for 479 items of load.
Location of each item of load	2.3	Populate the road names for the 45 items of load with no street address.
Description and capacity of load	2.4	Record lamp wattage and ballast values separately.

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit observation

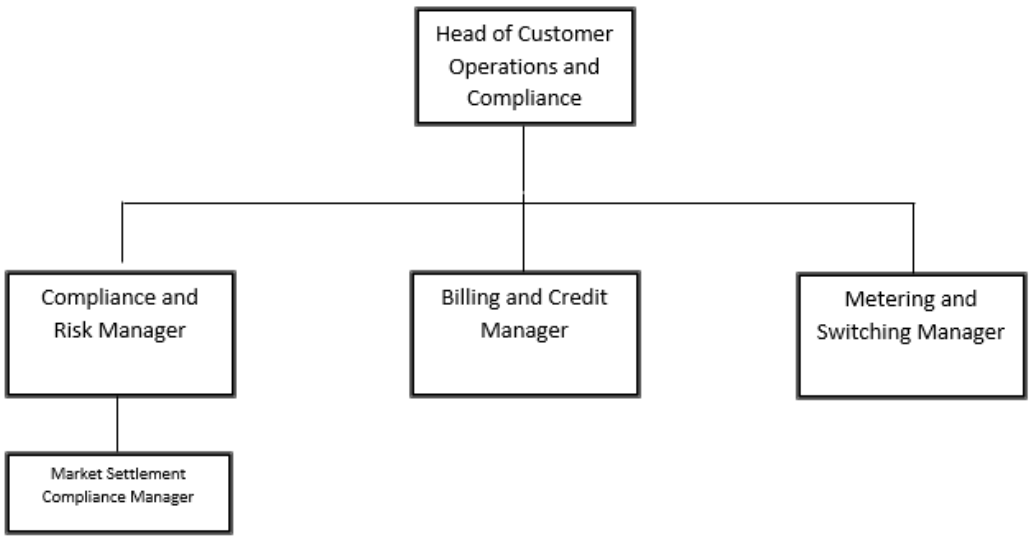
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

There are no exemptions in place relevant to the scope of this audit.

1.2. Structure of Organisation

Genesis provided the relevant organisational structure:



1.3. Persons involved in this audit

Auditor:

Name	Company	Role
Rebecca Elliot	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Julia Jones	Technical Specialist - Reconciliations Team	Genesis Energy
Kieran Straw	Civil Projects Team Leader	Waimakariri DC

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The database is commonly known as "RAMM" which stands for "Road Assessment and Maintenance Management". The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

Access to the database is secure by way of password protection.

Systems used by the trader to calculate submissions were assessed as part of their reconciliation participant audits.

1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000366371MPF7B	STREET LIGHT SBK 0331	SBK0331	SST	2,170	219,411
0000565850KEA7B	DISTRIBUTED STREETLIGHTING OLD KAIAPOI BOROUGH	KAI0111	SST	480	45,751
0000366372MP3BB	STREET LIGHTING KAI0111	KAI0111	SST	2,683	223,384
0000282125MP3EF	STREETLIGHTS SBK0661SWN	SBK0661	SST	57	6,747
0000305303MPA1B	STREETLIGHTS SBK0661BHL	SBK0661	SST	66	8,002
0000328410MP099	STREETLIGHTS SBK0661BHL (Riverlea Estate)	SBK0661BHL	SST	197	13,661
0000366449MP595	Pegasus Town	KAI0111	SST	43	8,546
TOTAL				5,696	525,412

1.7. Authorisation Received

All information was provided directly by Genesis or Waimakariri District Council.

1.8. Scope of Audit

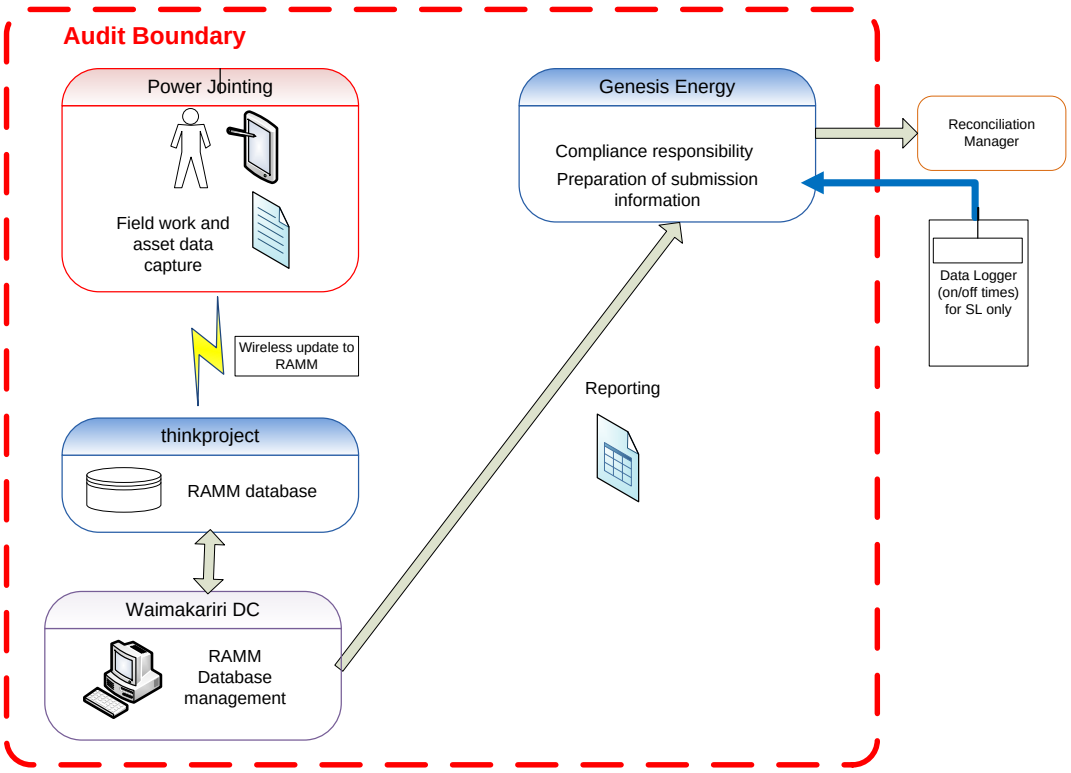
This audit of the WDC DUML database and processes was conducted at the request of Genesis, in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1, which became effective on 1 June 2017.

WDC is located on the MainPower network. MainPower was previously engaged as the streetlighting maintenance contractor.

WDC took over the management of the database from MainPower from November 2021. WDC are managing the RAMM database and the streetlighting maintenance contractor is Power Jointing. WDC are establishing new processes and gaining an understanding of manging RAMM.

The diagram below shows the flow of information and the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 352 items of load on 8th December 2021.

1.9. Summary of previous audit

The previous audit was completed in May 2021 by Rebecca Elliot of Veritek Limited for Genesis Energy Ltd. Seven non-compliances were identified, and two recommendations were made. The statuses of the non-compliances and recommendations are described below.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Incorrect submission for two ICPs resulting in an estimated under submission of 105,199 kWh per annum. Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum. 162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum. 66 light types with no ICP recorded (including the 32 items of load with no wattage recorded), resulting in an estimated under submission of 16,734 kWh.	Cleared Still existing Still existing for different lamps
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	66 items of load with no ICP recorded.	Cleared
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	Inadequate location information for eight items of load.	Cleared
Description and capacity of load	2.4	11(2)(c) & (d) of Schedule 15.3	32 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 5,390 kWh annually.	Still existing for different lamps
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional lights found in the field.	Still existing for different lamps
Database Accuracy	3.1	15.2 and 15.37B(b)	Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum. 162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum. 66 items of load with no ICP recorded resulting in an estimated under submission of 16,734 per annum. Inadequate location information for eight items of load.	Still existing Still existing for different lamps

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	Incorrect submission for two ICPs resulting in an estimated under submission of 105,199 kWh per annum. Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum. 162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum. 66 items of load with no ICP recorded resulting in an estimated under submission of 16,734 per annum.	Cleared Still existing Still existing for different lamps

Subject	Section	Recommendation	Status
Location of items of load	2.3	Update road names for some items of load from Petries Road to Fearne Drive, Ranby Place, Catchpole Place, Hamlett Drive, Benjes Place, Keeper Close.	Cleared
Database accuracy	3.1	Review and change the lamp wattage to the correct value and remove the reference to ballast.	Still remaining for some

1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Genesis has requested Veritek to undertake this streetlight audit.

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe.

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

- *DUML database is up to date*
- *methodology for deriving submission information complies with Schedule 15.5.*

Audit observation

The process for calculation of consumption was examined and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

Genesis reconciles this DUML load using the SST profile. The methodology for deriving submission information is compliant.

The on and off times were derived from data logger information.

I checked the submission data for November 2021 and confirmed they were calculated correctly.

The last audit noted light discrepancy counts for ICPs 0000366372MP3BB and 0000366371MPF7B resulting in under submission:

ICP	Light Count March 2021	Database extract light count	Light count difference	Submitted kWh Value	Expected kWh Value	kWh difference
0000366372MP3BB	2,546	2,710	164	80,453	84,616	4,163
0000366371MPF7B	2,421	2,577	156	88,126	92,729	4,603
					TOTAL	8,766

No corrections have been carried out resulting in an estimated under submission of 78,894 kWh (assuming under submission has occurred between March -November 2021). This is recorded as non-compliance below.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 138,500kWh.

Some database content inaccuracies have led to inaccurate volume information as detailed in **sections 2.4** and **3.1**. Specifically:

- 198 items of load do not have a lamp model and lamp wattage recorded which could result in an estimated under submission of 70,190 kWh annually,
- 361 items of load have the incorrect wattage applied which could result in an estimated annual over submission of 5,616 kWh per annum,
- eight lamps are recorded as model 350W MH in the database, this not a valid wattage for the lamp type. These are likely to be overstated. I was unable to determine the correct wattage so I am unable to calculate the impact these will have on reconciliation, and

- festive lights not recorded in RAMM.

The current monthly report is provided as a snapshot and this practice is non-compliant. The database contains a "Light install date". When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes is provided.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 17-Apr-21 To: 29-Nov-21	Incorrect submission for two ICPs resulting in an estimated under submission of 78,894 kWh from March-November 2021. Database accuracy is outside of the allowable threshold resulting in an estimated under submission of 138,500 kWh per annum. 198 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 70,190 kWh per annum. 361 items have the incorrect wattage applied indicating an estimated over submission of 5,616 kWh per annum. Eight lamps recorded as 350W MH but no such model exists. These are likely to be overstated and therefore over submission will be occurring. Festive lights not recorded in RAMM resulting in a small amount of under submission. The monthly wattage report provided does not track changes on a daily basis and is provided as a snapshot. Potential impact: High Actual impact: High Audit history: Once Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are recorded as weak as the database used for submission has a large number of discrepancies. WDC is implementing new processes to improve the data completeness and accuracy. The impact is assessed to be high due to the impact on submission.

Actions taken to resolve the issue	Completion date	Remedial action status
Over the past few months Genesis has reviewed the datasets provided by Waimakariri and provided feedback. Genesis defaults wattage/gear wattage where wattage values are not populated. Where description differ from wattage values, Genesis requests these to be reviewed by the council to update accordingly as to which piece of information is accurate.		Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis is no longer the responsible trader for this database and have provided a copy of the audit to the current trader		

2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

Code reference

Clause 11(2)(a) and (aa) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

Audit observation

The database was checked to confirm an ICP was recorded against each item of load.

Audit commentary

All items of load have an ICP recorded.

479 items of load have the ICP recorded in the database as 000056580KEA7B, the correct ICP is 0000565850KEA7B.

Recommendation	Description	Audited party comment	Remedial action
Clause 11(2)(a) and (aa) of Schedule 15.3	Correct the ICP number recorded incorrectly: 0000565850KEA7B for 479 items of load.	Genesis has not yet discussed the outcome of this audit with the database owner due to them switching traders.	Investigating

Audit outcome

Compliant

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

The DUML database must contain the location of each DUML item.

Audit observation

The database was checked to confirm the location is recorded for all items of load.

Audit commentary

The RAMM database contains a field for the nearest street address and there are GPS coordinates. There are a total of 22 items of load with no GPS coordinates recorded. The street address was sufficient to locate those.

There are 45 items of load with no street address, they all have GPS co-ordinates recorded so they can be located. I recommend populating the street address for these items of load.

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 11(2)(b) of Schedule 15.3	Populate the road names for the 45 items of load with no street address.	Genesis has not yet discussed the outcome of this audit with the database owner due to them switching traders.	Investigating

The roads identified in the last report that were recorded with an incorrect street address, have now been updated.

Audit outcome

Compliant

2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

Code reference

Clause 11(2)(c) and (d) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *a description of load type for each item of load and any assumptions regarding the capacity*
- *the capacity of each item in watts.*

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

Audit commentary

WDC RAMM database contains the manufacturers lamp model, lamp make, lamp model and lamp wattage that is a combined value of wattage and ballast. The WDC database records the total wattage in the lamp wattage field for all items of load. I recommend that the lamp wattages and ballast values are recorded separately.

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 11(2)(c) and (d) of Schedule 15.3	Record lamp wattage and ballast values separately.	Genesis has not yet discussed the outcome of this audit with the database owner due to them switching traders.	Investigating

198 items of load do not have a lamp model and lamp wattage recorded. This has increased from the 32 items of load recorded in the last audit as the RAMM database is being used for reconciliation. This could result in an estimated under submission of 70,190 kWh per annum. The calculation is based on the most common light type of 70W HPS. The accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) & (d) of Schedule 15.3 From: 17-Apr-21 To: 29-Nov-21	198 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 70,190 kWh per annum. Potential impact: High Actual impact: High Audit history: Once Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are recorded as weak as the database used for submission has a large number of discrepancies. WDC is implementing new processes to improve the data completeness and accuracy. The impact is assessed to be high due to the impact on submission.

Actions taken to resolve the issue	Completion date	Remedial action status
Over the past few months Genesis has reviewed the datasets provided by Waimakariri and provided feedback. Genesis defaults wattage/gear wattage where wattage values are not populated. Where description differ from wattage values, Genesis requests these to be reviewed by the council to update accordingly as to which piece of information is accurate.		Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis is no longer the responsible trader for this database and have provided a copy of the audit to the current trader		

2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3)

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

The retailer must ensure that each item of DUML for which it is responsible is recorded in this database.

Audit observation

The field audit was undertaken of a statistical sample of 352 items of load.

Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
ALLISON CRES	20	21	+3		3 x additional 70W HPS found in the field
BEACHVALE DR	35	39	+4		4 x additional 70W HPS found in the field
BLACKETT ST	36	37	+1		1 x additional 150W HPS found in the field
EL ALAMEIN AVENUE	6	7	+1	1	1 x additional 70W HPS found in the field 1 x 35W LED recorded in the database but lamp labelled 26W in the field
HELMORE ST	6	7	+1		1 x additional 60W COS found in the field
JOHN RAVEN LANE	5	5		5	4 x 26W LED recorded in the database but lamps labelled as 20W in the field 1 x 73W LED recorded in the database but 1 x 20W LED found in the field
KAWARI DR	20	21	+1		1 x additional 70W HPS found in the field
KEIR ST	2	3	+1	1	1 x additional 70W HPS found in the field 1 x 33W LED recorded in the database but 1 x 70W HPS found in the field
KENSINGTON AVE	22	23	+1		1 x additional 70W HPS found in the field
MITCHELL ST	5	5		5	5 x 21W LED recorded in the database but lamps labelled as 27W in the field
MODENA PL	9	8	-1		1 x 70W HPS not found in the field
OAKLEIGH ST	2	2		2	2 x 26W LED recorded in the database but lamps labelled as 20W in the field
PARSONAGE RD	13	15	+2		2 x additional 70W HPS found in the field
PEACOCK PL	5	6	+1		1 x additional 70W HPS found in the field
ROWSE ST	12	13	+1	1	1 x additional 70W HPS found in the field 1 x 33W LED recorded in the database but 1 x 70W HPS found in the field
SALISBURY AVE	8	9	+1	4	4 x 33W LED recorded in the database but lamps labelled as 27W in the field 1 x additional 27W LED found in the field

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
SIENA PL	7	8	+1		1 x additional 70W HPS found in the field
SOUTHBROOK RD	20	21	+1	1	1 x additional 250W HPS found in the field 1 x lamp wattage recorded as 0 in database, but labelled 116W in the field
THORNE PL	2	2		1	1 x 33W LED recorded in the database but 1 x 70W HPS found in the field
YELLOWLEES DR	5	6	+1		1 x additional 70W HPS found in the field
Grand Total	**5,745**	**5,765**	**22 (+21-1)**	**21**	

I found 21 additional lamps in the field than were recorded in the database and 21 lamps with incorrect wattages of the sample of 352 items of load sampled. The items missing from the database are recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 17-Apr-21 To: 29-Nov-21	21 additional lights (6%) found in the field from the 352 items of load sampled. Potential impact: Medium Actual impact: Medium Audit history: Four times Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as weak. WDC are reviewing and implementing new processes to improve data accuracy and completeness. The impact is assessed to be medium due to the number of additional lights found in the field.

Actions taken to resolve the issue	Completion date	Remedial action status
Over the past few months Genesis has reviewed the datasets provided by Waimakariri and provided feedback. Genesis defaults wattage/gear wattage where wattage values are not populated. Where description differ from wattage values, Genesis requests these to be reviewed by the council to update accordingly as to which piece of information is accurate.		Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis is no longer the responsible trader for this database and have provided a copy of the audit to the current trader		

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

The RAMM database functionality achieves compliance with the code.

The change management process and the compliance of the database reporting provided to Genesis is detailed in **sections 3.1** and **3.2**.

Audit outcome

Compliant

2.7. Audit trail (Clause 11(4) of Schedule 15.3)

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUML database must incorporate an audit trail of all additions and changes that identify:

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database*

Audit observation

The database was checked for audit trails.

Audit commentary

The RAMM database contains a complete audit trail. Reporting is provided to Genesis from the RAMM database.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Waimakariri District Council
Strata	The database contains items of load in the Waimakariri District Council area. The processes for the management of items of load are the same, but I decided to place the items of load into three strata, as follows: 1. A – G street names, 2. H – P street names, and 3. Q – Z street names. NZTA lighting is a separate audit report and not included.
Area units	I created a pivot table of the roads in each area, and I used a random number generator in a spreadsheet to select a total of 38 sub-units.
Total items of load	352 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority against the database or in the case of LED lights against the LED light specification.

The change management process to track changes and timeliness of database updates was evaluated.

Audit commentary

A field audit was conducted of a statistical sample of 379 items of load. The "database auditing tool" was used to analyse the results, which are shown in the table below.

Result	Percentage	Comments
The point estimate of R	106.2	Wattage from survey is higher than the database wattage by 6.2%
R_L	103.0	With a 95% level of confidence, it can be concluded that the error could be between +3.0% and +8.98%
R_H	108.9	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019. The table below shows that Scenario B (detailed below) applies, and the best available estimate indicates that the database is not accurate within ± 5.0%.

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 3.0% and 8.9% higher than the wattage recorded in the DUML database.

In absolute terms the installed capacity is estimated to be 32 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 16 kW and 47 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 138,500kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 67,400 and 198,900 kWh p.a. higher than the database indicates.

Scenario	**Description**
A - **Good accuracy, good precision**	This scenario applies if: (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
B - **Poor accuracy, demonstrated with statistical significance**	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either R_L is less than 0.95 or R_H is greater than 1.05. There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
C - **Poor precision**	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) R_L is less than 0.95 and/or R_H is greater than 1.05 The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

Light description and capacity accuracy

Lamp and gear wattages for all other lamps were compared to the expected values, and the following exceptions were identified:

Model	Database wattage	Correct wattage	Quantity	Total difference
125W MV	137	136	4	4
160W MV	184	175	8	-72
70W MH	70	83	8	104
150W MH	150	168	11	198
400W MH	400	438	1	38
400W HPS	400	438	5	190
30W40LED4K LEH2	35	30	6	30
40W30LED4K LEH2	45	40	73	-365
40W49LED4K LEH2	47	42	83	-415
Philips 40W49LED4K	47	42	95	-475
65W49LED4K LEH2	73	65	54	-432
90W49LED4K LEH2	102	90	4	-48
48M 450mA	68	60	9	-72
Total			**361**	**-1315**

This could result in an estimated annual over submission of 5,616 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

Eight lamps are recorded as model 350W MH in the database, this not a valid wattage for the lamp type. These are likely to be overstated. I was unable to determine the correct wattage so I am unable to calculate the impact these will have on reconciliation. This is recorded as non-compliance. I have included a picture for reference:

As discussed in **section 2.4,** 198 items of load do not have a lamp model and lamp wattage recorded. This could result in an estimated under submission of 70,190 kWh annually. The calculation is based on the most common light type of 70W HPS. This is recorded as a non-compliance.

533 items of load have an incorrect ballast of one recorded. This field is not being used for submission, so this has no effect on submission accuracy but is recorded as non-compliance. I recommend in **section 2.4** that the lamp and ballast values are recorded separately.

Address location accuracy

As discussed in **section 2.3**, there is a total of 22 items of load with no GPS coordinates recorded. The street address was sufficient to locate those. 45 items of load do not have a street associated they all have GPS co-ordinates recorded.

Change management process findings

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. WDC have recently taken over the management from MainPower, and new processes are being established.

Power Jointing is the contractor for installation and maintenance of all lighting. When new subdivisions or upgrades are conducted, an "as-built" plan is provided. Lighting for new subdivisions is updated as soon as the subdivision is electrically connected. This process is currently under review by WDC and will require the provision of the livening date to be used as the start date in RAMM.

Pocket RAMM is used for fieldwork, unless there is a connectivity issue and in that situation a worksheet will be completed in the field by the technician and updated by Power Jointing in the office.

The current monthly report is provided as a snapshot and this practice is non-compliant and this is recorded as non-compliance in **sections 2.1** and **3.2**. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes is provided.

There is a small LED roll-out programme underway, approx. 200 – 300 LEDs will be rolled out per annum. Lights that fail are replaced like for like, this is mainly due to stock supply issues, as it is difficult to get LEDs.

Outage patrols are no longer conducted, any outages reported to WDC will be assigned to Power Jointing to fix.

Festive lights

There are some festive lights connected to the Wamakariri DC street light circuits. WDC are establishing a new process to manage the reporting to Genesis for inclusion in submission information. The volumes associated with these lights is small. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: 15.2 and 15.37B(b) From: 17-Apr-21 To: 29-Nov-21	Database accuracy is outside of the allowable threshold resulting in an estimated under submission of 138,500 kWh per annum. 198 lights with no lamp description or total wattage recorded. 361 items have the incorrect wattage applied indicating an estimated over submission of 5,616 kWh per annum. Eight lamps are recorded as model 350W MH in the database, this not a valid wattage for the lamp type. 533 items of load with an incorrect ballast of one recorded. Festive lights not recorded in RAMM. Potential impact: High Actual impact: High Audit history: Once Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are recorded as weak as the database used for submission has a large number of discrepancies. WDC is implementing new processes to improve the data completeness and accuracy. The impact is assessed to be high due to the impact on submission.

Actions taken to resolve the issue	Completion date	Remedial action status
Over the past few months Genesis has reviewed the datasets provided by Waimakariri and provided feedback. Genesis defaults wattage/gear wattage where wattage values are not populated. Where description differ from wattage values, Genesis requests these to be reviewed by the council to update accordingly as to which piece of information is accurate.		Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis is no longer the responsible trader for this database and have provided a copy of the audit to the current trader		

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that the ICP has the correct profile and submission flag, and
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Genesis reconciles this DUML load using the SST profile. The methodology for deriving submission information is compliant.

The on and off times were derived from data logger information.

I checked the submission data for November 2021 and confirmed they were calculated correctly.

The last audit noted light discrepancy counts for ICPs 0000366372MP3BB and 0000366371MPF7B resulting in under submission as detailed in **section 2.1**. No corrections have been carried out resulting in an estimated under submission of 78,894 kWh (assuming under submission has occurred between March -November 2021). This is recorded as non-compliance below.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 138,500kWh.

Some database content inaccuracies have led to inaccurate volume information as detailed in **sections 2.4** and **3.1**. Specifically:

- 198 items of load do not have a lamp model and lamp wattage recorded which could result in an estimated under submission of 70,190 kWh annually,
- 361 items of load have the incorrect wattage applied which could result in an estimated annual over submission of 5,616 kWh per annum,
- eight lamps are recorded as model 350W MH in the database, this not a valid wattage for the lamp type. These are likely to be overstated. I was unable to determine the correct wattage so I am unable to calculate the impact these will have on reconciliation. This is recorded as non-compliance, and
- festive lights not recorded in RAMM.

The current monthly report is provided as a snapshot and this practice is non-compliant. The database contains a "Light install date". When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes is provided.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: 15.2 and 15.37B(c) From: 17-Apr-21 To: 29-Nov-21	Incorrect submission for two ICPs resulting in an estimated under submission of 78,894 kWh from March-November 2021. Database accuracy is outside of the allowable threshold resulting in an estimated under submission of 138,500 kWh per annum. 198 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 70,190 kWh per annum. 361 items have the incorrect wattage applied indicating an estimated over submission of 5,616 kWh per annum. Eight lamps recorded as 350W MH but no such model exists. These are likely to be overstated and therefore over submission will be occurring. Festive lights not recorded in RAMM resulting in a small amount of under submission. The monthly wattage report provided does not track changes on a daily basis and is provided as a snapshot. Potential impact: High Actual impact: High Audit history: Once Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are recorded as weak as the database used for submission has a large number of discrepancies. WDC is implementing new processes to improve the data completeness and accuracy. The impact is assessed to be high due to the impact on submission.

Actions taken to resolve the issue	Completion date	Remedial action status
Over the past few months Genesis has reviewed the datasets provided by Waimakariri and provided feedback. Genesis defaults wattage/gear wattage where wattage values are not populated. Where description differ from wattage values, Genesis requests these to be reviewed by the council to update accordingly as to which piece of information is accurate.		Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis is no longer the responsible trader for this database and have provided a copy of the audit to the current trader		

CONCLUSION

WDC is located on the MainPower network. MainPower was previously engaged as the streetlighting maintenance contractor and were providing a monthly report from their database. Genesis have been using the last database extract provided by Mainpower until November 2021 when reporting has been provided from the RAMM database. This audit is the first audit of the WDC RAMM database.

WDC are managing the RAMM database and the streetlighting maintenance contractor is Power Jointing. The field work and asset data capture is conducted by Power Jointing using Pocket RAMM.

WDC are establishing new processes and gaining an understanding of managing RAMM.

The field audit was undertaken of a statistical sample of 352 items of load on 8th December 2021.

This audit found five non-compliances and makes three recommendations. The future risk rating of 42 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis's comments and recommend that the next audit be in six months to allow new processes to be put in place.

PARTICIPANT RESPONSE

Waimakariri suddenly switched traders during the process of responding to the audit findings. Genesis will request the new trader to supply the data sets over the coming months to see any improvements that can be utilised to correct the historical settlement revision during Genesis' ownership.